

# **A Software Process Ontology and Its Application**

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**Li Liao<sup>1</sup>, Yuzhong Qu<sup>1</sup>, Hareton K.N.Leung<sup>2</sup>**  
yzqu@seu.edu.cn

**Southeast University**  
**Hong Kong Polytechnic University**

# Outline

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- ❑ Introduction
- ❑ Related work
- ❑ Software Process Ontology (SPO)
- ❑ Usage of SPO in SP assessment
- ❑ Conclusion & Future work

# 1. Introduction

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## ❑ Software Process

- Software quality
- Software productivity

## ❑ Software Process Models

- Capability Maturity Model (CMM)
- ISO/IEC 15504
- etc.

# 1. Introduction (Con.)

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- ❑ The problems emerged in the usage of the Process Models & possible solutions
  - Lack formal description
    - ✓ Using ontology to represent processes and process models
  - Difficulty in transformation among different models
    - ✓ Building ontologies for the current process models and using ontology alignment techniques
- ❑ An ontology approach to semantic description of SP

## 2. Related Work

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- ❑ Systems using Knowledge Representation techniques in describing SP
  - **Examples:** EPOS, Marvel, SPADE, etc.
  - **Limitation:** Variety in knowledge representation, mainly focusing on the development processes (scope limited).
- ❑ SPI tools (38 tools [13])
  - Their extensibility is limited
  - They did not support the mapping between the models

## 3. Software Process Ontology (SPO)

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- ❑ Abstract architecture of Software Process Models
- ❑ Atomic practice model to build SPO
- ❑ Framework of SPO
- ❑ Extension of SPO

## 3.1 Abstract architecture of Software Process Model

The taxonomies of the models' components

<b>Model Component</b> <b>Model</b>	<b>Subsystem</b>	<b>Category</b>	<b>Process</b>	<b>Sub-Process</b>	<b>Practice</b>	<b>Process Attribute</b>
<b>CMM</b>		<b>Category</b>	<b>Key Process Area</b>		<b>Key Practice</b>	
<b>CMMI</b>		<b>Category</b>	<b>Process Area</b>	<b>Specific Goal</b>	<b>Specific Practice</b>	<b>Generic Goal</b>
<b>ISO/IEC 15504</b>		<b>Category</b>	<b>Process</b>	<b>Component Process</b>	<b>Base Practice</b>	<b>Process Attribute</b>
<b>ISO 9001</b>	<b>Subsystem</b>		<b>Main topic area</b>		<b>Management issue</b>	
<b>BOOTSTRAP</b>	<b>Process Area</b>	<b>Process Category</b>	<b>Process</b>		<b>Practice</b>	

## 3.1 Abstract architecture of Software Process Model (Con.)

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- ❑ Not only the structures of the models are similar, but also the coverage of these models overlaps.
- ❑ The contents of these processes can be mapped.



## 3.2 Atomic practice model

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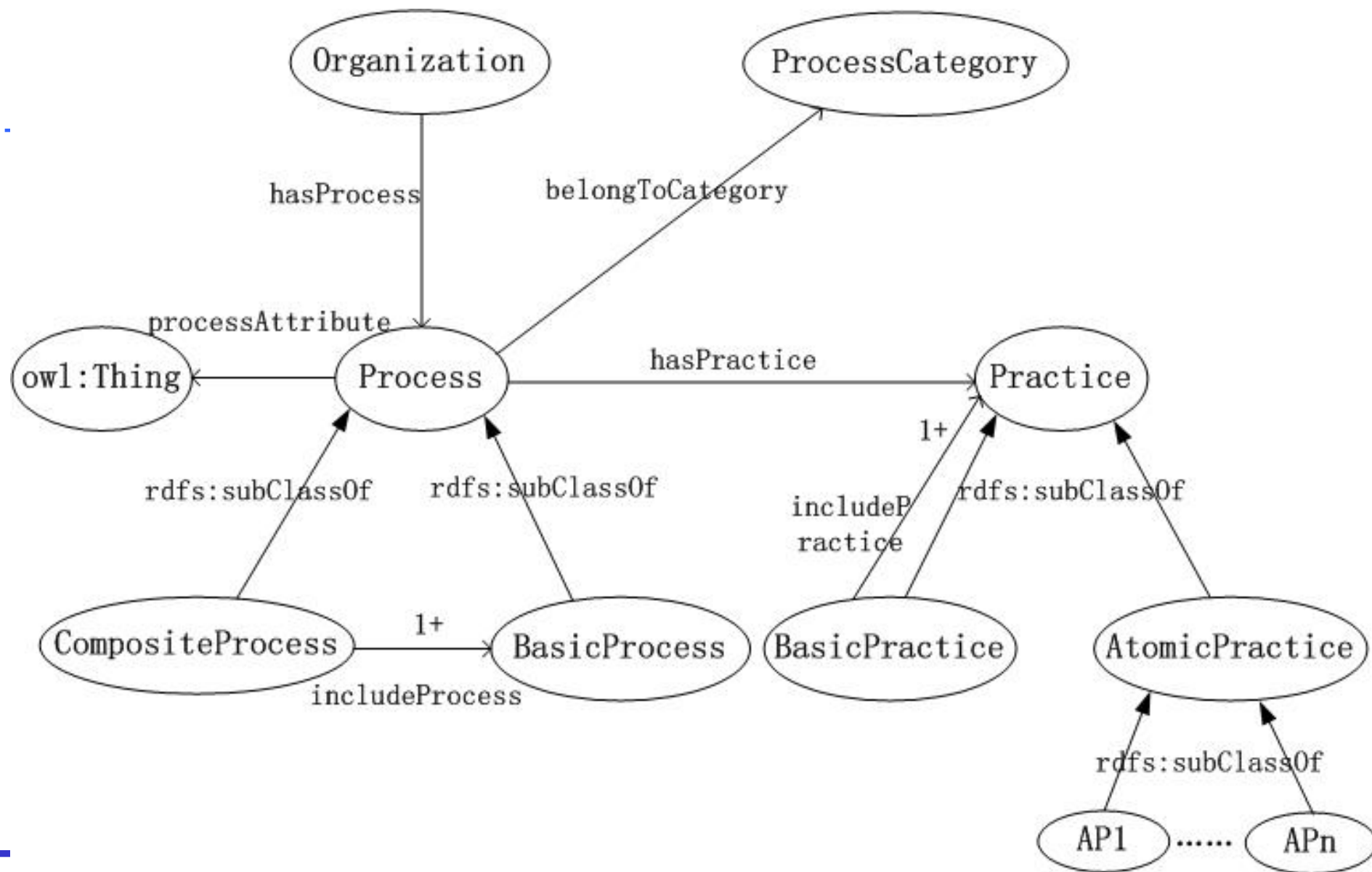
- ❑ The atomic practice is the minimal activity that can develop software artifacts or support the engineering process.
- ❑ Atomic Practice Model (APM) is a unified set of atomic practices.
- ❑ A software process is composed of a collection of practices, and a practice comprises a collection of the atomic practices.

## 3.2 Atomic practice model (Con.)

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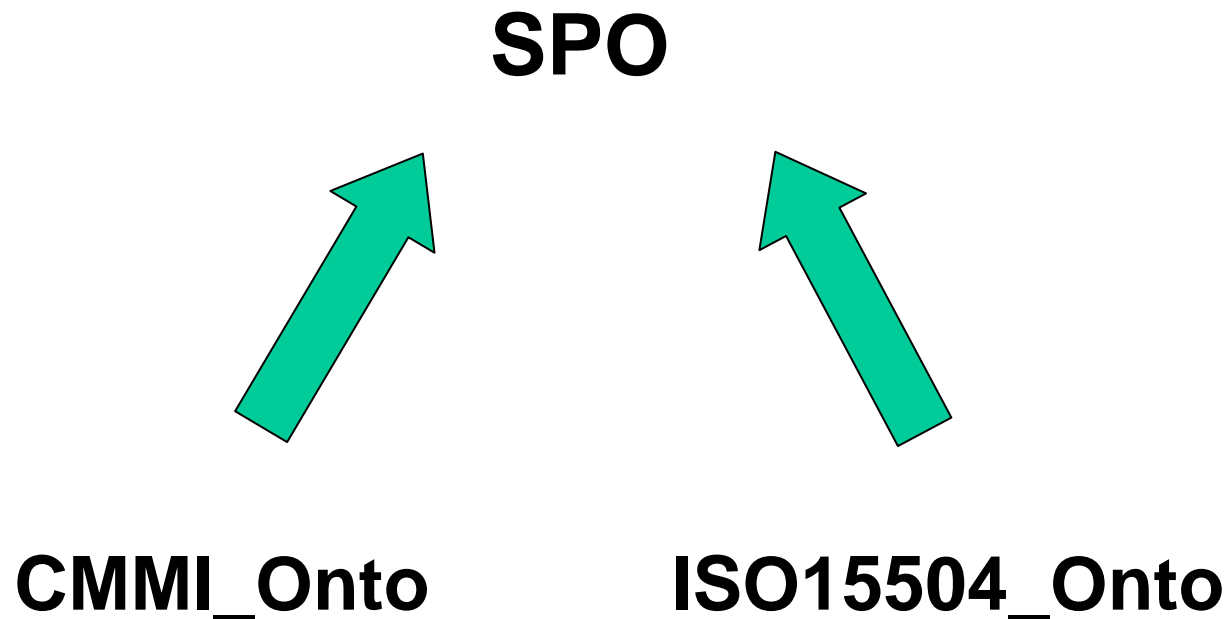
- Attributes of an atomic practice :
  - Activity Name and Purpose
  - Artifacts used/ required
  - Task description
  - Task responsibility
  - Product(s)/Document(s) developed
  - Measures

## 3.3 Framework of SPO

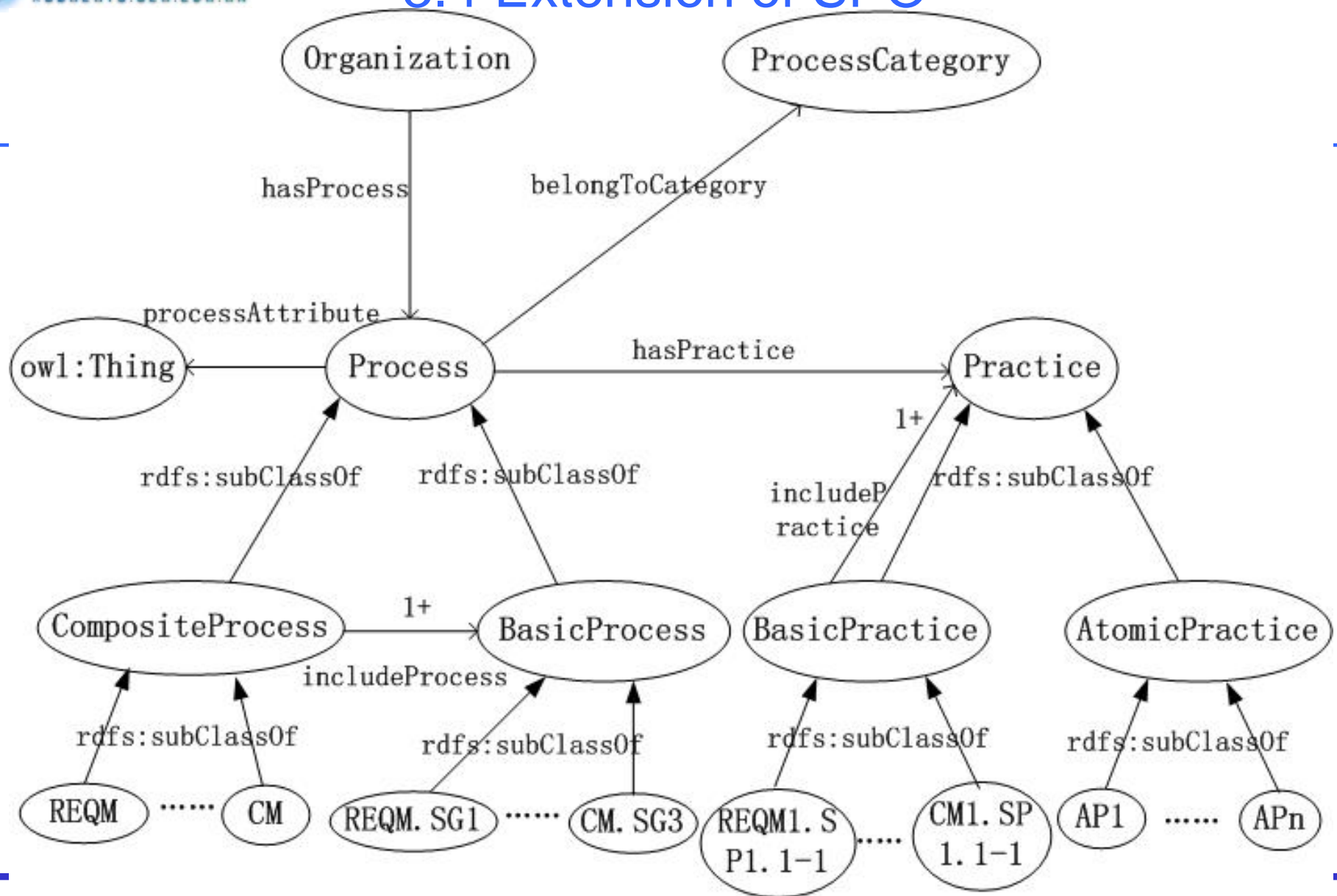


## 3.4 Extension of SPO

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## 3.4 Extension of SPO



## 4. Usage of SPO and its extensions

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- A prototype of a web-based process assessment tool
  - Evaluate your SP by different Models
  - <http://cse.seu.edu.cn:8080/spo/index.jsp>

## 5. Conclusion and Future work

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- ☐ Improve the ontology for software process
- ☐ Improve the mapping between different models
- ☐ Construct process model for the software organizations

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Thank you!

Q&A

**<http://xobjects.seu.edu.cn>**